

Surgical management of superior petrosal sinus dural arteriovenous fistulae with dominant internal carotid artery supply

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Introduction

Endovascular embolization with liquid embolic agents has emerged as the standard interventional approach to tentorial dural arteriovenous fistulae (DAVF). While technological advances have improved the efficacy of transarterial and transvenous endovascular approaches, superior petrosal sinus (SPS) DAVF with dominant internal carotid artery (ICA) supply frequently require surgical intervention for definitive closure.

Methods

To compare the angiographic and clinical efficacy of endovascular and surgical interventions in patients with SPS DAVF, the records of 19 patients with 21 DAVF from August 2010 to November 2015 were retrospectively reviewed.

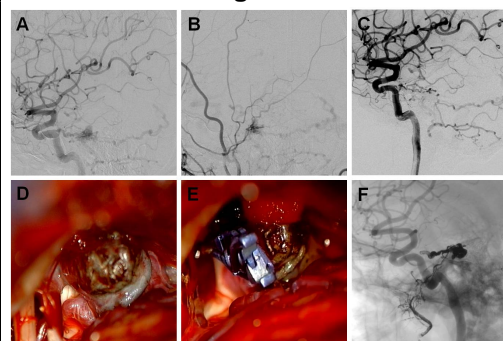
Results

Within this cohort, eight patients with nine SPS DAVF were eligible for evaluation. Five DAVF were initially treated with endovascular embolization, while the remaining four underwent surgical occlusion without preoperative embolization. Of the endovascularly treated SPS DAVF, two (40%) remained occluded on follow-up cerebral angiography, while the remaining three (60%) persisted or recurred and required surgical intervention for definitive closure. Of the four SPS DAVF treated with primary surgical occlusion, all four (100%) remained closed on follow-up cerebral angiography. In addition, of the three SPS DAVF that persisted or recurred following embolization and required rescue surgical closure, all three (100%) remained occluded on follow-up cerebral angiography. Two (100%) SPS DAVF that were successfully treated with endovascular embolization had major or minor external carotid artery (ECA) supply, while the three (100%) persistent lesions had principal ICA supply via the meningohipophyseal trunk (MHT). Three (75%) of the four SPS DAVF treated with primary surgical occlusion had dominant MHT supply.

Conclusions

Complete endovascular closure of SPS DAVF with dominant ICA supply via the MHT may difficult to achieve, while upfront surgical intervention is associated with a high rate of complete occlusion.

Figure 1



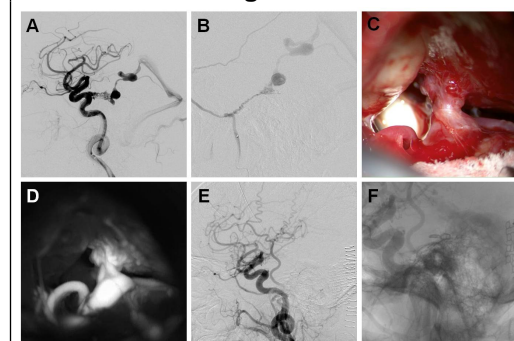
SPS DAVF with dominant ICA supply with recurrence following initial Onyx embolization requiring definitive microsurgical clip occlusion.

Learning Objectives

By the conclusion of this session, participants should be able to:

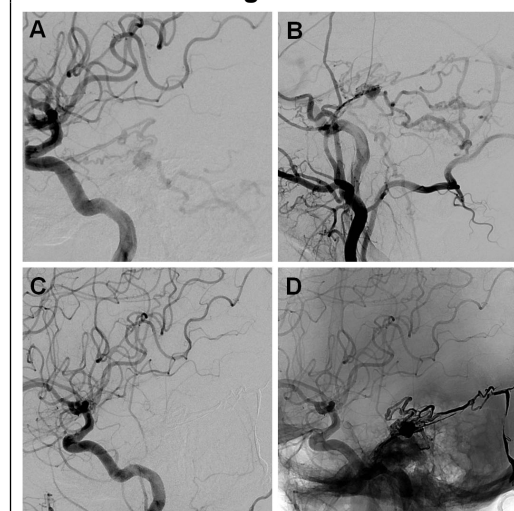
- 1) Describe the importance of arterial anatomy in SPS DAVF.
- 2) Discuss, in small groups, the interventional options for management of SPS DAVF relative to each lesion's arterial anatomy.
- 3) Identify an effective treatment of SPS DAVF based upon lesion arterial anatomy and available technologies.

Figure 2



SPS DAVF with dominant ICA supply with definitive microsurgical clip occlusion.

Figure 3



SPS DAVF with dominant ECA supply with definitive Onyx embolization.